Effects of Activating Team Diversity Dimensions on Member Perceptions of Conflict, Trust, and Respect

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Research findings regarding the effects of team diversity have been mixed, as some literature suggests diversity is beneficial while other findings suggest diversity may be detrimental. The discrepancy in team diversity research findings seems to be rooted in the fact that while team diversity can at times be helpful (for tasks involving idea generation, creativity, and decision-making), diverse teams often struggle with members splitting into subgroups, which is detrimental to team functioning. Complicating our understanding of the role of diversity on team processes is the fact that diversity often exists on multiple dimensions. This study took a new approach in which faultline activation (making a team aware of differences across members) and cross-cutting diversity dimensions (composing the team in a manner that maximizes similarity across members) were studied with live interacting teams that had members of varying national origin and gender. Multilevel modeling was used to explore the effect of faultline activation and cross-cutting at the team level of analysis. When faultline activation was established by making diversity dimensions within the team apparent, team members experienced higher relationship conflict as well as lower levels of trust and respect, even when controlling for their performance on a team task. These findings suggest that an awareness of which group processes may be negatively impacted by activating faultlines is essential to ensure a positive team climate. Furthermore, the results regarding the detrimental influence of faultline activation regardless of diversity dimension composition (cross-cut or non cross-cut teams) indicate that faultline activation may have a stronger effect than cross-cutting.

Keywords: faultline theory, faultline activation, cross-cutting, cross-categorization, team diversity

The U.S.A. is becoming increasingly diverse and the workforce parallels this change (Bureau of Labor Statistics, 2014). This workforce change in combination with the increasing use of teams in organizations has made understanding the benefits and detriments of diversity in team contexts increasingly important (Salas, Weaver, Rosen, & Smith-Jentsh, 2009; van Knippenberg & Schippers, 2007). Despite the importance of understanding the impact of diversity, the research on its benefits and detriments is decidedly mixed. Some research shows that diversity causes in-group and out-group biases or us-them categorizations and therefore has a negative effect on group functioning (e.g., Chatman & Flynn, 2001). Other research has found that diversity is an asset to team outcomes because it brings about more ideas, discussion, and integration of knowledge (e.g., van Knippenberg, De Dreu, & Homan, 2004).

Complicating our understanding of the role of diversity on team processes and functioning is that diversity typically exists on multiple dimensions (Lau & Murnighan, 1998; 2005). Thus, a deeper understanding of the effects of diversity requires examining subgroups that form on several of these diversity categories instead of solely focusing on one category (e.g., gender). Further research has been focused on the effects of activating these multiple subgroup differences within teams (e.g., Pearsall, Ellis, & Evans, 2008). This activation refers to making teams aware of in-group and out-group differences (i.e., identifying diversity faultlines). There is some evidence to suggest that if differences between subgroups are not brought to the attention of members, there is less prevalence of subgroup formation (Jehn & Bezrukova, 2010; Pearsall et al., 2008). However, if made salient, this awareness may have a negative effect on team processes and outcomes. Nevertheless, much of this research has focused on a limited set of diversity variables. There is a need to examine a broader array of diversity variables,

including culture and gender, to understand how these may affect team processes differently or more strongly due to their high salience to an individual. Although demographic variables cannot take the place of psychological processes and individual differences to explain organizational outcomes (Lawrence, 1997), a team composition including both males and females as well as two different cultures can help explain the roots of relationship conflict, trust, and respect issues that occur in diverse work teams (e.g., Homan, van Knippenberg, van Kleef, & De Dreu, 2007).

Given that all teams likely present some level of diversity, it is logical to examine how multiple dimensions of diversity impact these team processes and outcomes. Some research has examined how team composition can be structured to take advantage of the multiple dimensions of diversity in a way that all members have a common category with almost every other member of the team (i.e., cross-cutting/ cross-categorization; Homan et al., 2007). This idea of cross-cutting in the context of diversity is posited to minimize in-group and out-group biases from forming within teams because team members see fewer differences between themselves and the other members (Singh, Yeoh, Lim, & Lim, 1997).

Although teams with considerable diversity (i.e., having members from several different cultures, of both genders, different job functions) are used more and more in the workplace, there is still a great need for understanding what team composition is best for successful group processes and outcomes for these teams. To examine these questions, this study uses the faultline theory (Lau & Murnighan, 1998; 2005) and cross-cutting techniques (e.g., Brewer, 2000) in an attempt to explain team processes and outcomes in teams diverse in gender and culture.

Impact of Diversity on Team Functioning

Although teams are being used in organizations with increasing frequency, there are still two conflicting views regarding the amount of value diversity holds for team processes (e.g., relationship conflict) and outcomes (e.g., performance; Williams & O'Reilly, 1998). Some research shows that diversity is an asset to team outcomes because it brings about more ideas, discussion, and integration of knowledge (e.g., van Knippenberg et al., 2004), but

other research has found that team diversity causes in-group and out-group biases and therefore has a negative effect on team functioning (e.g., Chatman & Flynn, 2001). Each perspective is explained in turn and relevant research is discussed.

Information/decision making perspective. The information/decision making view argues that diversity is beneficial to team outcomes because it brings about more ideas, discussion, and integration of knowledge, which can in turn aid in team tasks (Homan et al., 2007; van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). Other researchers have found that this informational diversity also leads to more error detection, information processing, team effectiveness, and team problem solving (Gruenfeld, Mannix, Williams, & Neale, 1996; Phillips, Mannix, Neale, & Gruenfeld, 2004). Organizations often use teams because of the diverse skill set and experience they can provide in the face of the contemporary issues of the business world, such as globalization, pressures for innovation, and immensely fast-paced changes (Kozlowski & Bell, 2003; Maznevski, 1994). Overall diversity within teams can allow for the flexibility and adaptability that team reflexivity tends to initiate. Furthermore, in light of the increase in the number of global companies, organizations can benefit from the competitive advantage and an opportunity for creativity that diverse teams can provide over and beyond the use of teams in general (Watson, Kumar, & Michaelsen, 1993).

The literature involving the information/ decision-making perspective points to the idea that team diversity can be valuable for tasks involving a necessity for innovation, idea generation, creativity, and problem solving (e.g., Cox & Blake, 1991; Distefano & Maznevski, 2000), which are considered to be more challenging and difficult types of tasks. For example, Bowers, Pharmer, and Salas (2000) conducted a meta-analysis comparing the performance of teams that were homogeneous to those that were heterogeneous on personality, gender, and ability level. They found a moderating effect of task difficulty (low, medium, high) on team performance in that heterogeneous teams were moderately better ($d = .53$) at difficult tasks (e.g., business games) but homogeneous teams were much better at low difficulty tasks ($d = .95$), such as tasks involving

low stimulus certainty, processing demands, and response complexity (e.g., puzzle solving). In line with these findings, Watson et al. (1993) found that brainstorming tasks in which people must identify problems and come up with solution alternatives are better for diverse work teams as well. Having people with different perspectives and opinions can be helpful for non-routine tasks because they have more pooled knowledge, skills, and abilities available to them (van Knippenberg & Schippers, 2007).

Social categorization perspective. The social categorization perspective of diversity in teams is the opposing viewpoint to the informational/ decision making perspective. It suggests diversity causes in-group and out-group biases or us-them categorizations (Homan et al., 2007). These in turn can lead to intergroup bias resulting in prejudice against the out-group as well as in-group favoritism (Brewer, 1999). This perspective relates to social identity theory (Tajfel, 1978; Turner, 1975), which states that people organize their understanding of the world on the grounds of categorizing others into distinctly different subgroups, often demographic in nature. For example, McCann, Ostrom, Tyner, and Mitchell (1985) found that mentally sorting people into demographic categories helps us to make distinctions among others in heterogeneous teams. The in-groups in which people categorize themselves are usually quite salient and have great relevance to their identity.

Tajfel's (1978) and Turner's (1975) social identity theory also describes these categorizations as being emotionally significant. This suggests categories that we feel we belong to can hold emotional meaning for us. This theory states that subgroup categorizations are intergroup schemas that are sometimes set-up implicitly (Banaji, Hardin, & Rothman, 1993; Tajfel, 1978; Turner, 1975). Not only can these categorizations be implicit, but they also tend to occur quickly based on demographic categories (Fiske, 2000). However, the negative impact of categorizing based on demographics may be minimized over time as team members get to know one another on a deeper level (Pelled, Eisenhardt, & Xin, 1999). Individuals can determine others' likely gender, age, and race within milliseconds and tend to quickly detect if others are in-group or out-group members on these dimensions (Banaji & Hardin, 1996).

As a result of many individuals' strong identity with their in-group, it is a tendency to have more favorable attitudes and respect towards, and even preferentially treat those that are most like us within a heterogeneous team (Brewer, 1999). For example, in the context of teams, Zellmer-Bruhn, Maloney, Bhappu, and Salvador (2008) found that if team members perceive that other members are similar to themselves overall, they categorize members less on the basis of diversity dimensions made salient in the study compared to when they perceive the other members as different from themselves.

Overall, these more favorable attitudes toward the in-group lead to more trust, cooperation, and overall peaceful relations toward in-group members compared to those in the out-group (e.g., van Knippenberg & Schippers, 2007), causing more conflict in the team as a whole (between subgroups). Also, the social categorization perspective describes diverse teams as having more detrimental team processes overall, such as lower satisfaction and more conflict, that in turn leads to lower performance (e.g., Pelled et al., 1999). More specifically, Pelled et al. (1999) found that racial diversity within a team is positively associated with relationship conflict. In line with this perspective, Chatman and Flynn (2001) found that demographic diversity resulted in lower team cooperativeness, which relates to higher relationship conflict.

Faultline Theory and the Present Experiment

Regardless of the perspective that diversity is either beneficial or detrimental, research in this area has primarily focused on one diversity dimension at a time. However, when diversity exists, it rarely exists on only one dimension (Lau & Murnighan, 1998; 2005). For example, in teams people are generally diverse per gender, age, country of origin, and ethnicity. These multiple diversity categories create more than one in- group and out-group which can magnify the negative implications suggested by the social categorization perspective (Lau & Murnighan, 2005). Furthermore, subgroups formed by multiple dimensions can be stronger, meaning they result in more negative team processes and outcomes than subgroups based on only one category (Lau & Murnighan, 2005). By studying multiple facets of diversity simultaneously, it is likely that research can capture more explanatory

power regarding heterogeneous teams, including a greater understanding of team process outcomes.

Following the social categorization perspective of in-group and out-group formation within work teams, Lau and Murnighan (2005) used what they called "faultline theory" to explain in detail how and where these subgroups are created in diverse teams. They discuss how the amount of similarity and dissimilarity in a team as well as the amount of salience of the members' attributes can affect whether certain faultlines are activated, or brought to the attention of team members. Often there are more possible faultlines within a team than are actually used to form subgroups and therefore the issue of what initiates faultline activation will be discussed in more detail in the next section.

Lau and Murnighan's faultline theory (1998; 2005) states that multiple types of diversity within a team increase subgroup categorization. This can lead to more relationship conflict and lower satisfaction in teams with several diversity dimensions compared to teams without much diversity or with only one level (e.g., only differing in gender). Supporting the faultline theory, Hart and van Vugt (2006) found that when groups split off from one another due to relationship conflict, they tend to break along faultlines developed between subgroups. In addition, they found that participants anticipated that there would be more cooperation among their in-group members compared to perceived out-group members. Also, they found that once team fissions or separations did occur, the overall cooperation increased within these breakaway groups, suggesting that there was indeed more cooperation among the in-group.

Lau and Murnighan (1998) argued that the more types of diversity in a given team, the more obvious the faultline is that separates members into in-groups and out-groups. Lau and Murnighan's (1998) research provides evidence for an effect of faultline strength, meaning stronger faultlines lead to more negative group processes, such as conflict, than weaker faultlines. In later work, Lau and Murnighan (2005) found that team processes such as work communications and psychological safety (which relates to trust) were lower for groups with strong faultlines compared to groups with weak faultlines, supporting the hypothesized effects of faultline

strength. Also, they found that faultlines on gender and race explained more variance than diversity in a single-attribute (e.g., just gender) for several member perceptions: team learning, psychological safety, satisfaction, and expected performance. Thus, faultline theory can help with our understanding of team processes and outcomes and therefore warrants further research.

Activating faultlines. Lau and Murnighan (1998) state that there are usually more existing faultlines in a team than are actually activated. This brings up the questions of what tends to activate faultlines and why. Research has shown that people tend to categorize others quickly and often implicitly, especially on noticeable facets of diversity such as demographics (Fiske, 2000; Tajfel, 1978; Turner, 1975). Thus, faultlines are naturally occurring hypothetical dividing lines through which a team may develop subgroups (Lau & Murnighan, 1998; 2005). Lau and Murnighan (1998) state that faultlines may stay dormant and the team may continue without splitting into subgroups on the non-activated dimension. Therefore, when differences are brought to a team's awareness (i.e., activated), it follows that subgroups are more likely to form along these faultlines.

In line with these findings, Polzer, Crisp, Jarvenpaa, and Kim (2006) found that teams of graduate students with activated faultlines based on geographic distance reported higher levels of conflict and lower trust among members than those that did not have activated faultlines. Furthermore, they found these activated faultlines were even more detrimental in regards to conflict and trust for teams that had equal distributions of members across subgroups (e.g., two members in one subgroup and two members in a second subgroup). In addition, the negative effects on these team process variables were stronger when a given subgroup included members that had a shared country of origin compared to subgroups in which members differed on country of origin.

Pearsall et al. (2008) studied the effects of gender faultline activation on team creativity through the use of an idea generation task, which was manipulated to be gender neutral or focused on only one gender. They found that activation of gender faultlines negatively affected team creativity (i.e., number and overall creativity of ideas generated), but this impact was not

present when gender faultlines were not activated. These findings suggest that the simple existence of a possible faultline within a team is not enough to trigger it to form subgroups. Instead faultlines are activated when they are task relevant, leading to detrimental team outcomes. Pearsall et al. also found that the level of conflict present when gender faultlines were activated partially mediated team creativity, meaning that teams with activated faultlines were less creative than teams without faultline activation and this was partly due to the greater amount of conflict in faultline activated teams. This finding is consistent with previous faultline research suggesting faultlines can initiate more relationship conflict, which in turn negatively impacts team performance. Jehn and Bezrukova (2010) also found that teams with activated faultlines had higher levels of team conflict, lower levels of satisfaction and team performance, and were more likely to form coalitions (i.e., two or more members that cooperate to achieve a subgroup-desired outcome rather than one that benefits the entire team) than teams with non-activated faultlines.

The present study. In the present study, faultlines were either nonactivated or activated. Activation in this study refers to making team members aware of their differences through a verbal statement about their differences or through a task that brings those differences to the forefront of members' awareness, a technique utilized in past research (e.g., Lau & Murnighan, 1998; 2005). Both types of activation were used in this study in order to make clear distinctions between activated and nonactivated conditions. Furthermore, as mentioned earlier, activation is important in that dormant faultlines may not result in the negative outcomes associated with activated faultlines.

Following the findings of relevant past research on faultline activation, it is hypothesized that there will be an effect of faultline activation, such that activation negatively impacts team processes and outcomes:

H1a) Teams in which faultlines are activated will have more relationship conflict than teams in which faultlines are not activated.
H1b) Teams in which faultlines are activated will have lower trust among members than teams in which faultlines are not activated.

H1c) Teams in which faultlines are activated will have lower respect among members than teams in which faultlines are not activated.
H1d) Teams in which faultlines are activated will have lower objective performance than teams in which faultlines are not activated.

Cross-cutting in Teams

Overall, faultline theory supports the idea that as the dimensions of diversity in a work team increases relationship conflict, damages the team climate, and lowers team performance when faultlines are activated. It seems that strong faultlines which create subgroups on more than one diversity dimension, such as teams that differ on gender, race, age, or culture, would be problematic according to faultline theory (Lau & Murnighan, 1998). This makes it difficult to determine how to use diversity to promote positive team outcomes while avoiding the team relationship conflict that can occur in diverse groups. Since Lau and Murnighan's (1998) coining of faultline theory, research has examined if there is a way to minimize these negative team outcomes, while maximizing positive outcomes.

The idea of cross-categorization or cross-cutting different levels of diversity is an attempt to reduce the negative impact of faultlines within a team by structuring teams in a way that alters members' perceptions that the group is divided by a faultline into subgroups. Cross-cutting techniques reconcile Williams and O'Reilly's (1998) two previously discussed differing perspectives on team diversity: the informational/decision-making perspective and social categorization perspective. While faultline theory supports the social categorization perspective, it focuses mostly on the negative aspects involved in team diversity due to subgroup formation. As aforementioned, the information/decision-making perspective suggests the possible benefits of diverse teams without explaining how to minimize negative implications such as conflict. Cross-cutting diversity dimensions acknowledges the fact that diversity often exists in teams as Lau and Murnighan (1998; 2005) explain in their faultline theory. However, by minimizing the possibility of subgroup formation within a team by cross-cutting dimensions of diversity, the knowledge and ideas available to diverse teams can be used.

Cross-cut teams are structured in a way that members have at least one common dimension (such as gender or race) with most other members in the team. Therefore, although a member may be considered part of the out-group in the team on one diversity dimension, they are also a member of the in-group on another dimension. In turn, this can diffuse or minimize the negative effects of social categorization within the team (Brewer, 2000) that are initiated by the faultlines that separate them into subgroups. An example of a cross-cut team on the two dimensions of race and gender is a team with one Asian female, one Asian male, one Caucasian female, and one Caucasian male. Note that cross-cutting increases similarity across diversity dimensions of race and gender in this example, but that a given individual still does not share a dimension with one other person in this team of four. This cross-cut team composition minimizes detrimental subgroup formation based on the formation of faultlines, which in turn tends to increase the social stability and tolerance within the team (Brewer, 2000). Brewer (1991) suggests that in-group bias is minimized in cross-cut teams because these multiple category memberships decrease the salience of any one specific social category to our identity. Therefore, following cross-cutting theory, teams that are cross-cut on dimensions of culture and gender, for example, should result in less intergroup bias on these dimensions because the faultlines are dissolved or broken.

There is some support for the effectiveness of cross-cutting on minimizing the perception of subgroups within a team. Deschamps and Doise (1978) were the first to link this idea to social psychological processes and found that participants perceived smaller differences among groups in the cross-cut conditions compared to the non cross-cut conditions. Therefore, this cross-cutting technique weakened their perceptions of in-groups and out-groups based on faultlines. Furthermore, Marcus-Newhall, Miller, Holtz, and Brewer (1993) examined the effects of cross-cutting using bogus feedback by telling participants they were either over-estimators or under-estimators on a dot estimation task. They cross-cut the type of estimator category with a bogus feedback category about which type of expert they were in the team: either cognitive experts or emotional experts on a specific task. They found that participants in the cross-cut condition perceived higher similarity among their team members than those in the non cross-cut condition. Furthermore, they found that subgroup formation was eliminated in cross-cut groups, whereas teams that were not cross-cut showed significant subgroup formation based on the assigned categories. Cross-cutting has also been found to minimize in-group bias within a team based on year in college (e.g., sophomores vs. freshmen; Rust, 1996) and political party (e.g., Republican vs. Democrat; Bettencourt & Dorr, 1998). Both Rust (1996) and Bettencourt and Dorr (1998) found results consistent with Marcus-Newhall et al.'s (1993) finding that the significant bias between in-group and out-group categories was eliminated when groups were cross-cut on two different dimensions.

Not only has cross-cutting dimensions of diversity been shown to lessen subgroup formation, but it seems to improve team processes as well. In an unpublished study by Homan and van Knippenberg (2003), it was found that cross-cutting leads to more favorable team processes than equally dividing along a faultline (as cited in van Knippenberg & Schippers, 2007). Also, Homan et al. (2007) studied cross-cutting within four-person teams on the dimensions of gender, informational diversity, and bogus personality feedback. It was found that participants in conditions with subgroups created by faultlines were less satisfied, had a more negative team climate, and had more relationship conflict unless they were cross-cut by informational diversity. The team climate variable refers to the extent to which teams feel psychological safety (related to trust) within the team, indicating that individuals in cross-cut teams were likely to feel more trust with the other members of the team than individuals in non cross-cut teams.

The present study. In the present study, culture and gender are the diversity variables of interest in cross-cutting. Culture was selected because it is closely linked with values and attitudes (whereas race and ethnicity are not in all cases), which are important aspects of one's identity (Maznevski, 1994) through which members of a team often categorize each other (Fiske, 2000; Tajfel, 1978; Turner, 1975). Gender was selected because it is often an important part of individuals' views of themselves in regards to their

own identity (Pearsall et al., 2008).

Following the findings of relevant past research on cross-cutting, it was hypothesized that there would be an effect of cross-cutting, in that teams with cross-cut diversity dimensions will have more positive effects on team processes and outcomes than those without cross-cut dimensions:

H2a) Teams that are cross-cut on gender and culture will have less relationship conflict than teams that are not cross-cut on these dimensions.

H2b) Teams that are cross-cut on gender and culture will have higher trust among members than teams that are not cross-cut on these dimensions.

H2c) Teams that are cross-cut on gender and culture will have higher respect among members than teams that are not cross-cut on these dimensions.

H2d) Teams that are cross-cut on gender and culture will have higher objective performance than teams that are not cross-cut on these dimensions.

Interaction of Cross-cutting and Faultline Activation

Although there are no studies that have examined cross-cutting and faultline activation within the same team, past findings regarding faultline strength and the effects of cross-cutting suggest a possible interaction. First, Lau and Murnighan's (1998/2005) research differentiates between strong and weak faultlines. They explained that strong faultlines are separated by more than one diversity dimension while weak faultlines are separated by only one dimension. Furthermore, research on cross-cutting (Bettencourt & Dorr, 1998; Brewer, 1991, 2000; Homan & van Knippenberg, 2003; Homan et al., 2007; Marcus-Newhall et al., 1993) shows that by its nature, this technique minimizes strong faultlines by creating teams with only one person per category (e.g., one U.S. born Caucasian female, one U.S. born Caucasian male, one Chinese female, and one Chinese male). Therefore, all members have only weak faultlines between themselves and most other people in the team (e.g., they each share either the same gender or

culture with all but one team member). Past findings indicate that weak faultlines result in much less negative team processes and outcomes than strong faultlines (Bezrukova et al., 2009; Lau & Murnighan, 1998, 2005). Therefore, diverse teams (on dimensions of gender and culture) which have been found to be negatively affected by faultline activation, may be less detrimentally affected when teams are not cross-cut. It is therefore logical that an interaction may exist between faultline activation and cross-cutting as indicated below:

H3a) There is an interaction for faultline activation and cross-cutting, such that teams with activated faultlines that are not cross-cut on gender and culture will report more relationship conflict than all other conditions.

H3b) There is an interaction for faultline activation and cross-cutting, such that teams with activated faultlines that are not cross-cut on gender and culture will report less trust than all other conditions.

H3c) There is an interaction for faultline activation and cross-cutting, such that teams with activated faultlines that are not cross-cut on gender and culture will report less respect than all other conditions.

H3d) There is an interaction for faultline activation and cross-cutting, such that teams with activated faultlines that are not cross-cut on gender and culture will have lower objective performance than all other conditions.

Within the context of composing diverse work teams, gender and culture are common aspects of diversity in present times when there are increases in the number of women and foreign-born individuals in the workforce (Bureau of Labor Statistics, 2013), in addition to the climate of globalization and international changes. However, there is surprisingly little research looking at both culture and gender within the same study and understanding if cross-cutting can ameliorate the negative impact of activated faultlines for team process and dynamics.

The present study examines the impact of faultlines and cross-cutting on the diversity dimensions of gender

and culture on team processes and outcomes. To our knowledge, there is no research that conjointly takes into account both gender and culture when studying the effects of faultline activation and cross-cutting on live interacting teams. To examine these questions, we employed an experimental simulation study in which participants interacted in groups on a creativity task. The team process variables of relationship conflict, trust, and respect, as well as the outcome variable of team performance on the task were measured. The team process data was analyzed using Hierarchical Linear Modeling (HLM6; a multilevel modeling program created by Raudenbush & Bryk, 2002). Multilevel modeling is the appropriate analysis to use in team contexts due to the fact that individuals are inherently nested within the team. Process variables (e.g., trust, respect, conflict) within a team are more similar than between teams because team processes most likely have a similar effect on all members due to their shared group environment. Because aspects of a team's environment are shared across members, member perceptions about their team experience (including perceptions of conflict, trust, and liking) are usually more similar than are perceptions of members across different teams. This must be taken into account statistically. Multilevel modeling allows for an understanding of both the variation across teams and the variation within teams (Rindskopf, 2010). Previous research has not taken this analytical approach to study faultlines or cross-cutting in teams.

Method

Participants

Participants were 212 undergraduate students from introductory psychology and management courses from a large Northeastern college. Participants received credit for their participation in the experiment. Half the participants were female and half were male as required by the design of the study. Culture was operationalized as a combination of ethnicity and national origin. Ethnicity was controlled within culture so that it was not confounded with this diversity dimension and also in order to make the cultural difference more salient. In this study, we included Caucasian participants whose national origin was the U.S.A. and Asian participants whose national origin was China. These countries

were selected because they have been found to be quite divergent on multiple cultural dimensions (House, Hanges, Javidan, Dorfman, & Gupta, 2004). Half the participants were Asian and born in China while the other half were Caucasian and born in the U.S.A. The age range of participants was 18-50 years ($M = 21.4$, $SD = 3.68$). In total, there were 53 four-person teams. Participants signed up for the study through an online recruitment system specifically for students at that college.

Design

The experiment consisted of a 2 (cross-cut on nationality and gender vs. not cross-cut on nationality and gender) x 2 (faultline activation vs. no faultline activation) factorial design. Sessions were randomly assigned to one of the four experimental conditions (cross-cut/faultline activation, cross-cut/no faultline activation, not cross-cut/faultline activation, not cross-cut/no faultline activation).

Creating cross-cut vs. not cross-cut teams. To create cross-cut teams on gender and culture, the team composition on both of these diversity dimensions was manipulated. Sessions were randomly assigned to either a cross-cut condition or a non cross-cut condition. In the cross-cut teams, four-person teams were created, consisting of the following: one female member who shared her cultural background (either born in the U.S. or in China) with only one male team member, but not the other female; the other female and male member shared a cultural background that was different from the first male and female members' backgrounds. An example of a cross-cut team was one that included one U.S. born Caucasian female, one U.S. born Caucasian male, one female born in China, and one male born in China.

To create teams that are not cross-cut on these dimensions, four-person teams without cross-cut compositions on gender or culture were created. An example of a team that is not cross-cut had two U.S. born Caucasian females and two males born in China. In addition, in the teams that are not cross-cut, the members that shared the same gender and culture were seated next to each other to make the faultline even more salient and noticeable, following the procedures of Homan et al.'s (2007) study.

Faultline activation. Sessions were randomly

assigned to either the activation or non-activation conditions. According to Lau and Murnighan (1998), demographic characteristics are the most easily noticed when a new team forms and therefore faultlines often occur along these types of characteristics. Therefore, faultlines based on gender and culture are likely to develop early and conflict may arise quite quickly within teams upon their formation (Lau & Murnighan, 2005), and studying these processes within laboratory-formed teams within a short timeframe is reasonable. However, according to Lau and Murnighan (1998) and Pearsall et al. (2008), faultlines may remain dormant unless something triggers them to divide along subgroups. Therefore, faultlines were activated in two ways: by making teams aware of their differences in gender and culture and activating faultlines through the task, following the procedures of Pearsall et al.'s (2008) study.

Verbal activation. In the activated conditions, the researcher stated to the teams that individuals in their team were very different in respect to gender and culture. In addition, each member had to tell their team their country of birth to make it obvious to everyone on the team. In the non-activation conditions, the participants were not told anything about their similarities or differences nor did they have to tell each other their country of birth.

Task activation. Faultlines in the activation conditions were also made task relevant, as research suggests is necessary to create the potential of subgroup formation (Lau & Murnighan 1998, 2005; Oakes, Haslam, & Turner, 1994; Pearsall et al., 2008; Turner, Hogg, Oakes, Reicher, & Wettherell, 1987). A commonly used creative idea generation task (e.g., Friedman & Forster, 2001; Goncalo & Staw, 2006) was used across teams, though the specifics of the task varied by the experimental condition. Teams in the activated faultline conditions were given a picture of a men's razor and as a team they had to think of as many ideas as they could to market this product in 15 minutes. They had to decide as a team whether an idea should go on the list, and after this task they had to come to a consensus as a team to order their ideas from what they considered to be their best idea to their worst idea in five minutes. They were told to discuss each strategy in turn before coming to a consensus

as a team on the order. Following the Pearsall et al. (2008) study procedures, the team had to specifically market the razor to only males in China. Teams in the non-activation conditions completed the same tasks, but they used a gender neutral product instead (e.g., an alarm clock marketed to both genders and to consumers both in the U.S. and China).

Procedure

Upon arrival, participants were welcomed to the experiment and told they would be participating in a study on group tasks. Participants were given a consent form to read and sign. Next, all the four-person teams completed a common team decision-making survival task in which they had ten minutes to rank the order of importance of a list of items in a hypothetical plane crash. This allowed more time for participants to work together as a team, which is more realistic as teams are usually together for more than 20 minutes. Also, this was a way to have all teams become somewhat comfortable with the structure of the tasks. Next, all the four-person teams completed a variation of a commonly used creative idea generation task mentioned earlier. Both the idea generation task and the ordering task were used based on past research that has shown these are the types of high cognitive level tasks for which diverse teams can be beneficial (Bowers et al., 2000; Cox & Blake, 1991; Distefano & Maznevski, 2000; Sawyer, Houlette, & Yeagley, 2006; Watson et al., 1993). After these two tasks, participants individually completed questionnaires regarding their attitudes towards various aspects of their team's functioning, which included all of the dependent measures. Next, participants completed a demographics questionnaire. Participants were then debriefed, given credit, and were free to leave.

Measures

The main dependent variables were relationship conflict, trust, and respect as well as objective team performance. Each measure except objective performance was rated by participants on a 5-point Likert scale with anchors of 1 (strongly disagree) to 5 (strongly agree). Objective performance was coded by the number of the ideas a given team came up with. Cronbach's alpha was used to determine

internal reliability estimates for the scores on each dependent variable except objective performance, as these variables were each measured with at least two items. The internal consistency of the scores was acceptable for all these measures as noted below.

Team relationship conflict. This variable was measured using modified versions of relationship conflict questions from the Intragroup Conflict Scale (Jehn, 1995). The five relationship conflict items are "There was relationship tension in my work group," "There was personality conflict in my work group," "People seemed to get angry while working in my group," "There was friction among members in my work group," and "There was emotional conflict in my work group." A composite team relationship conflict score was created by averaging the scores of the five relationship conflict items ($\alpha = .85$). All conflict items were reverse scored such that higher scores signified less conflict.

Trust and respect. Trust and respect have been shown to be important team process variables (e.g., Jehn & Mannix, 2001; Kozlowski & Bell, 2003; Kozlowski & Ilgen, 2006). Higher scores for these items indicate higher levels of trust and respect. All these items are from a study by Jehn and Mannix (2001). Trust was measured with two items: "I trusted my fellow group members" and "My group members were truthful and honest." Respect was also measured with two items: "I respect my fellow group members" and "I respect the ideas of the people in my group." Both trust and respect demonstrated sufficient internal consistency ($\alpha = .74$ and $\alpha = .86$, respectively).

Objective team performance. The number of non-repetitious marketing strategies generated by the team was the measure of objective performance, following Pearsall et al. (2008). The decision-making task of rank ordering their strategies was not a factor included in the objective team performance. Two raters that were blind to the experimental conditions rated performance. When raters' decisions were not identical, a third rater made the final decision. Raters were instructed to count the number of uniquely separate ideas on a given team's list. As the teams were instructed to generate ideas within the context of advertising, design of the product, and/or features of the product, all of these types of ideas were valid and

included in the total count. In order to be counted, the ideas had to be specified to the degree that it could be understood what the marketing technique was. For example, if the team wrote "color" on the list, it was not included in the number of ideas because it could not be known what exactly was meant by this. However, if the team wrote "make the product available in three different colors," this would be counted as one idea.

In addition to using objective performance as an outcome, performance was controlled for in the analyses of the team process variables. This is because it would often be obvious to teams whether they performed well or not on the tasks, which in turn could affect how they rated their team members regardless of their perceptions of relationship conflict, respect, and trust.

Demographics. Gender and national origin of participants were known prior to the study, as participants signed up ahead of time online in separate slots (one for U.S. born females, one for U.S. born males, one for Chinese females, and one for Chinese males) to ensure their eligibility for the study. After the study, these questions were asked again in a demographic survey along with participants' age, major, gender, country of birth, years they have lived in the U.S., native language, perceived fluency in English, and year in college. Finally, there was an additional question probing for suspicion to discover if participants guessed the nature of the study. However, no participants guessed the true nature of the hypotheses or true purpose of the study.

Coding Independent Variables

The independent variables were dummy-coded such that for faultline activation, conditions that were activated were coded as 1, while conditions that were not activated were coded as 0. For cross-cutting, conditions where teams were cross-cut on diversity dimensions of national origin and gender were coded as 0, while conditions where teams were not cross-cut were coded as 1.

Results

Descriptive Statistics

Descriptive statistics and correlations were

examined for all process dependent variables. Correlations between relationship conflict, trust, and respect were all statistically significant at the $p < .01$ level at both the individual level and the team level. Table 1 presents the means, standard deviations, and inter-correlations for all three dependent variables at the individual level, while Table 2 includes the means, standard deviations, and inter-correlations for all three dependent variables and objective performance at the team level.

Tests of Hypotheses

Given the nested structure of the data, multilevel modeling was used for this study. To determine if cross-cutting and activation had effects at the group level of analysis, multilevel modeling was performed for each dependent process variable (Hypothesis 1a-c, Hypothesis 2a-c, and Hypotheses 3a-c) while controlling for the team objective performance on the idea generation task. In nested data situations, the assumption of independence of observation cannot be ensured due to the relationships that exist among the individuals that are nested within the same team (Hofmann, 1997; Raudenbush & Bryk, 2002). Relationship conflict, trust, and respect within a team will innately be more similar than between teams because team processes most likely have a similar effect on all members due to this shared environment. Multilevel modeling is a technique that statistically accounts for this possible similarity based on a group-level variable and allows for an understanding of both the variation across teams and the variation within teams.

Three sets of analyses were done at the group level to test whether teams systematically differ as a function of the team-level characteristics (i.e., faultline activation and cross-cutting diversity dimensions). The first two sets of analyses were to determine if there were main effects of activation and cross-cutting on the process variables and the third set was to determine whether an interaction was present. For all three statistical models, separate analyses for each process dependent variable (e.g., relationship conflict, trust, and respect) were conducted and objective performance was controlled for at level 2. Variables were not mean-centered in the analyses and the coefficients from the multilevel analysis results reported in Tables 3, 4, and 5 are unstandardized.

Table 1
Means, Standard Deviations, and Intercorrelations at Individual Level

Variable	M	SD	1	2
1. Relationship Conflict	4.31	.62		
2. Trust	4.09	.63	.36**	
3. Respect	4.27	.59	.33**	.69**

**$p < .01$

Table 2
Means, Standard Deviations, and Intercorrelations at Team Level

Variable	M	SD	1	2	3
1. Relationship Conflict	4.31	.30			
2. Trust	4.09	.34	.47**		
3. Respect	4.27	.33	.50**	.78**	
4. Objective Performance	13.08	5.01	.05	-.06	.02

**$p < .01$

In this study, the individual level variables are participants' scores for the process dependent variables. Y_{ij} in the level 1 equation below represents the individual score of a specific participant in the study. β_{oj} is the mean level of the dependent variable for the *j*th individual (group mean) and r_{ij} is the level 1 residual which shows the variance not accounted for within individual scores.

$$Y_{ij} = \beta_{oj} + r_{ij}$$
$$\beta_{oj} = Y_{00} + \mu_0$$

For the second part of this set of equations for the level 1 model above, Y_{00} is the grand mean across all teams. Therefore, the group mean is a function of the sum of the grand mean and the between group variance (μ_0) or residual. Before this study's hypotheses could be tested, there must be variation among the group means. In this case, μ_0 would be significant, which indeed was found.

Hypotheses 1a-c were tested by predicting the group means on the dependent variables (β_{oj}) as a

Table 3
Faultline Activation Multilevel Analyses at Team Level (Controlling for Performance)

Variable	Coefficient (γ_{01})	SE	p
1. Relationship Conflict	.15	.09	.09
2. Trust	.17	.09	.09
3. Respect	.17	.09	.06

Note. Faultline activation conditions were coded as 1, no faultline activation as 0.

Table 4
Cross-cutting Multilevel Analyses at Team Level (Controlling for Performance)

Variable	Coefficient (γ_{01})	SE	p
1. Relationship Conflict	-.08	.09	.38
2. Trust	.04	.10	.66
3. Respect	-.06	.09	.55

Note. Non cross-cut conditions were coded as 1, cross-cut as 0.

Table 5
Multilevel Analyses for Cross-cutting and Faultline Activation Interaction at Team Level (Controlling for Performance)

Variable	Coefficient (γ_{01})	SE	p
1. Relationship Conflict	.06	.17	.71
2. Trust	.07	.19	.72
3. Respect	.11	.18	.54

function of the whether or not the team's faultlines were activated. Therefore, activation is included in the model at this step to test whether there is a main effect of faultline activation, as seen in the below equation.

$$\beta_{oj} = \gamma_{00} + \gamma_{01} \text{ (ACTIVATION)} + \text{(PERFORMANCE)} + \mu_0$$

Hypotheses 2a-c were tested by adding cross-cutting to the model as shown in the below equation.

$$\beta_{oj} = \gamma_{00} + \gamma_{01} \text{ (CROSSCUT)} + \text{(PERFORMANCE)} + \mu_0$$

Furthermore, Hypotheses 3a-c were tested by adding in the interaction to the level 2 model as seen in the below equation.

$$\beta_{oj} = \gamma_{00} + \gamma_{01} \text{ (ACTIVATION)} + \gamma_{02} \text{ (CROSSCUT)} + \gamma_{03} \text{ (INTERACTION)} + \text{(PERFORMANCE)} + \mu_0$$

Main effect of activation. For Hypothesis 1a, relationship conflict was entered at level 1 with faultline activation in level 2. Results did not quite reach traditional statistical significance levels ($p = .09$). Therefore, though relationship conflict was higher for teams that had faultline activation, as predicted, the relationship did reach statistical significance. Subsequently, trust and respect were each entered in turn at level 1 while keeping activation in the level 2 equation. Results were approaching significance for both trust and respect as well ($p = .08$ and $p = .06$, respectively), thus some support was also found for Hypotheses 1b and 1c. The results of these analyses are summarized in Table 3.

Main effect of cross-cutting. For Hypothesis 2a-c, relationship conflict, trust, and respect were each in turn entered into the level 1 equation with (non) cross-cutting in the level 2 equation. Results were not statistically significant (relationship conflict, $p = .38$; trust, $p = .66$; respect, $p = .55$), showing no support for Hypothesis 2a-c and suggesting no support for a main effect of cross-cutting regardless of whether faultlines were activated or not. The results of these analyses are summarized in Table 4.

Interaction of faultline activation and cross-cutting. The same process that was used to test the previous hypotheses was repeated for testing Hypotheses 3a-c by including relationship conflict, trust, and respect each in turn at level 1 while putting activation, cross-cutting, and an interaction term of these two in at level 2. None of the results were statistically significant, leading to no support for Hypotheses 3a-c (relationship conflict, $p = .71$; trust, $p = .72$; respect, $p = .54$). The results of these analyses are summarized in Table 5.

Objective performance. Hypotheses 1d and 2d refer to the predictions for main effects of activation and cross-cutting on objective performance. These were tested using univariate ANOVAs with the data aggregated to the group level, as this variable was

only at the team level. The effect of activation on performance was not statistically significant, $F(1, 49) = .80$, $p = .38$, $\eta^2 = .14$, providing no support for Hypothesis 1d. The effect of cross-cutting on performance was also not statistically significant, $F(1, 49) = .79$, $p = .38$, $\eta^2 = .14$, resulting in no support for Hypothesis 2d. Hypothesis 3d predicted an interaction between cross-cutting and activation for performance and was also tested using a univariate ANOVA with the data aggregated to the group level. However, results were not statistically significant; $F(1, 49) = .01$, $p = .92$, $\eta^2 = .05$.

Discussion

The purpose of the present study was to study the effects of cross-cutting and faultline activation on team process variables and performance. The effects were studied in several novel ways. First, cross-cutting strategies have rarely been done on naturally occurring dimensions but instead have often been studied through the use of bogus feedback to create subgroups within a team (e.g., Marcus-Newhall et al., 1993). Studying naturally occurring dimensions, such as culture and gender, is a necessary avenue to pursue because of their salience to our social identity (Tajfel, 1978; Turner, 1975; 1985). Past research also indicates that we categorize others very quickly and often without conscious control (Fiske, 2000). The few studies that have cross-cut on naturally occurring categories have been limited to political affiliation (Bettencourt & Dorr, 1998) and year in college (Rust, 1996). Secondly, the present study is the first that includes both cross-cutting and faultline activation within the same study design. Third, this study implements multilevel analyses to understand the team level effects on various dependent process variables, which is the appropriate method to use, though not always utilized in past cross-cutting research.

In this study, faultline activation led to marginally more relationship conflict, less trust, and less respect among teams than conditions in which faultlines were not activated, which occurred regardless of the cross-cutting condition. Given that our findings did not meet the traditional criterion for statistical significance, there are two potential interpretations of the results.

First, if these results were not significant because there truly are no differences in these process variables due to faultline activation, then activating these faultlines may not actually impact conflict, trust, or respect perceptions to an important extent for teams diverse in culture and gender. Additionally, no other existing studies included both cross-cutting and faultline activation techniques. Therefore this study is the first to allow for a comparison between the effectiveness of each on minimizing negative team processes. Furthermore, no past studies examining the potential effects of cross-cutting have utilized multilevel analyses, though more recent research has stated that this is the appropriate way to analyze such data (e.g., Rindskopf, 2010). It is possible that the studies that found cross-cutting to be beneficial for improving performance and team processes would have yielded different or even nonsignificant findings if these studies would have utilized multilevel analyses, which is more appropriate than the analyses typically conducted (e.g., t-tests, ANOVAs). Therefore, it may be important to re-analyze data provided from these studies with multilevel modeling to understand if the findings would still be significant. Additionally, it will be critical for future researchers to use multilevel modeling for team research topics where both individual level and team level relationships are of interest, which is the case for both cross-cutting and faultline research.

Second, if these results (which were approaching significance) were simply underpowered due to sample size or impacted by variables other than our intended manipulations, the implication is that potentially activated faultlines within a team may be too strong to be overcome by cross-cutting techniques, at least in the context used in this study. For example, if members of teams already knew each other from previous or current classes taken together, this could affect the findings in an unexpected manner such that the manipulations of cross-cutting and faultline activation could have less of an impact. Questions regarding team members' familiarity with one another were not asked in this study, but should be asked in future research. Additionally, it is possible that the manner in which cross-cutting and faultline activation were each manipulated were not strong enough to differentially impact the teams' perceptions and, in

turn, team processes. Though this study used similar methodology as previous related studies to manipulate these conditions, participants in this study live in New York City, a culturally-diverse location. Thus, perhaps participants' perceptions were less focused on ingroup and outgroup formation based on culture-related diversity than others' would be. If the same manipulations were done in more homogenous cities, perhaps the findings would differ. In line with this, much of the past work on cross-cutting was done in fairly homogenous settings (e.g., the Netherlands). If this is the case, the amount of diversity one is exposed to on a daily basis may create a boundary condition for the effects of cross-cutting and cultural faultline activation. Though cross-cutting was expected to ameliorate the negative impact of faultline activation, this study did not find support for this expectation.

However, neither cross-cutting nor faultline activation affected objective performance. Therefore, in this study, faultline activation had a marginally detrimental effect on team climate (conflict, trust, respect), but not on the actual team performance. Yet previous findings suggest that when diversity dimensions are related to the specific task participants are required to do, and the members' differences are made explicit prior to the task, team experiences can be negatively impacted. This indicates teams will likely work less cohesively in these situations and will probably enjoy the working relationships less than teams whose differences are not made obvious. Clearly, more research must be done in this domain to determine if these relationships exist and, if so, to determine how robust they are.

Future Research

As with any study, this study has several potential limitations. First, the teams in this study met only once and for the duration of just one hour. Although this is a step in the right direction towards generalizability to actual interacting teams, results could potentially vary depending upon the amount of time teams have to interact. Second, in this study we operationalized culture as a combination of national origin and ethnicity, though within a given country it is likely that various individuals hold different cultural beliefs or values regardless of ethnicity. Third, faultlines could have been inadvertently

activated in cross-cut conditions due to the possibility that participants' may have still created subgroups based on one demographic dimension (e.g., gender), regardless of the second demographic dimension (e.g., culture) cross-cutting this. If a given participant identified more with their culture or more with their gender, perhaps cross-cutting did not impact the team functioning as has been found in past research, which may explain the lack of effect of cross-cutting in this study.

For future research, studies should examine if cross-cutting could minimize negative impacts of team diversity in the work domain, as this has never been done with a sample of employees. Faultline processes should also be examined in the work context as many organizations may unknowingly activate particular faultlines within diversity training, though this research is yet to be carried out. It would also be informative to study actual working teams in an organization that may differ on common dimensions such as job function and tenure in addition to studies specifically looking at cross-cutting effects on culture and gender in this environment.

Regardless of whether future studies are conducted with student or employee samples, it may be worthwhile to look at differential subgroup perceptions within a team. The current study did not do so being that participants were specifically asked to answer questions in relation to their perceptions of the team as a whole, but not perceptions of specific members in their team. It is possible that members of a given diversity dimension (e.g., females) may feel higher satisfaction, perceive less relationship conflict, etc. with other females regardless of culture. The current study made the task important or relevant to the gender as well as the cultural dimension to avoid this. However, it would be interesting to study whether one dimension such as gender is more salient than others when given a task that is not directly relevant to these dimensions.

Conclusion

It is pertinent to continue studying diverse team processes as van Knippenberg and Schippers (2007) strongly suggest. We must move this research into different realms, such as actual workplace teams, and with various other diversity dimensions that have

too often been overlooked (e.g., sexual identity, job function, tenure on the job). It is essential to respect the complexity of team diversity research and continue striving to implement several complimentary or even contradictory theories into the same research design to improve our understanding of the processes involved in diverse teams. In addition, although the present study's predicted positive effect of cross-cutting in diverse teams was not found, cross-cutting should be examined in future studies to determine if it could have the predicted positive impact in other contexts.

Furthermore, the necessity for the implementation of the most appropriate statistical analyses for the given theoretical questions asked is essential. In team research, multilevel modeling is often the most appropriate procedure for identifying the effects of team level manipulations. Future research is encouraged to use these statistical methods as well. Lastly, although it is not the most simple nor by far the quickest manner in which to do research, involving salient identities such as culture and gender into team studies is worthwhile not only due to the scarcity in which this is done, but also because of the sheer importance of these dimensions to many people's identities.

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